

Docket No.: 1509-441

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of :
Christian S. SIEFERT :
New U.S. Patent Application :
Filed: August 18, 2003 :
For: GRAPHICAL USER COMPUTER INTERFACE

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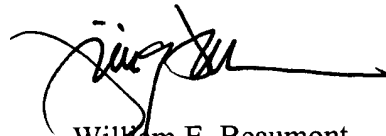
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Dear Sir:

In accordance with the provisions of 35 U.S.C. 119, Applicant hereby claims the priority of British Patent Application No. 0219122.9, filed August 16, 2002 in the present application. The certified copy is submitted herewith.

Respectfully submitted,

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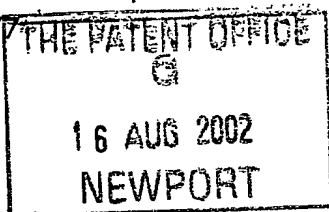
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16AUG02 E741677-1 D01463
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1. Your reference 200111401-1 GB

2. Patent application number
(The Patent Office will fill in this part) 0219122.9

3. Full name, address and postcode of the or of each applicant (underline all surnames)
Hewlett-Packard Company
3000 Hanover Street
Palo Alto
CA 94304, USA

Patents ADP number (if you know it)

Delaware, USA

If the applicant is a corporate body, give the country/state of its incorporation

496588001

4. Title of the invention Graphical User Computer Interface

5. Name of your agent (if you have one) Bruce G R Jones
Hewlett-Packard Ltd, IP Section
Filton Road, Stoke Gifford
Bristol BS34 8QZ

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

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Fee Sheet

11. I/We request the grant of a patent on the basis of this application.

Signature

Date

Bruce Graeme Roland Jones 12 August 02

12. Name and daytime telephone number of person to contact in the United Kingdom

K Nommeots-Nomm Tel: 0117-312-9947

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Graphical User Computer Interface

FIELD OF THE INVENTION

The present invention relates generally to computing systems providing a user with pointing functionalities, and more particularly, to a graphical user computer interface, a computer and a computer program for enabling a user to open at least one menu and to select an item of the menu by means of a pointing device.

BACKGROUND OF THE INVENTION

In recent years the performance of computer systems has increased impressively thanks to better CPU times, faster clock rates, increased working memory, etc. As a result of faster computer systems, the computer programs which are run on the computer systems are also becoming more and more complex with regard to the handling of these programs. This complexity is compounded by an appropriation of more functionalities. Regarding the development of word processing programs, for example, the complexity of functionalities has increased impressively. In the beginning, as word processing programs were introduced into the private sector, these programs were provided with basic functionalities, i.e. the possibility of adjusting only a few parameters compared to the adjustment possibilities offered by word processing programs nowadays. Previously, it had been more or less possible to change the text type, size of the type and basically to adjust the frame. Certainly, in the word processing programs of more recent years, the number of these adjustments possibilities and features increased gradually but, without doubt, they cannot approximate to those word processing programs which are in use nowadays.

With increasing functionalities, features and thus complexity of contemporary computer program products, it is becoming more and more

1 complicated to undertake an adjustment and/or to select a feature. This
2 complication requires a correspondingly greater time commitment. In recent years,
3 it was possible to select an item of a menu by opening the corresponding menu.
4 Nowadays, as there are so many more items, it is sometimes necessary to open a
5 menu and then a sub-menu to find and select the desired item of the menu.
6 Sometimes, even the sub-menus themselves lead to further sub-menus of their
7 own. This explains why it takes more time to find and select a desired menu item.

8 A selection can be made by inputting a special combination of keys or by
9 using an appropriate pointing device, e.g. a computer-mouse, a touch pad or a
10 pointing stick. The following relates to a brief description of a computer mouse. A
11 computer-mouse includes a ball and a roller inside the mouse. By moving the
12 mouse, the ball raps against the rollers inside the mouse. One roller measures
13 side-to-side motion and the other measures up-and-down motion. The rollers have
14 encoder wheels with metal points which send electrical signals to a computer-
15 mouse software installed in the computer to determine speed and pointer position.
16 The mouse is best operated on a mouse pad (a rectangular piece of material
17 which provides better traction than the desk top). By moving the computer-mouse
18 to the right on the surface of the pad, the pointer also moves to the right on the
19 screen. The mouse is usually attached to the computer by a fine cable, but
20 wireless mouse units also exist.

21 The top of the mouse contains one or more buttons (usually three). After
22 moving the mouse pointer on the screen, it is possible to select a menu item by
23 pressing and releasing a computer-mouse button, a "click". A selection of a menu
24 item is also possible by pressing and releasing a mouse button twice, which is
25 called "double-clicking". This process is often used to start programs or to open a
26 document. The main advantage of a mouse is that it is easy to use and with a little
27 practice, it is easier and faster to select items, start programs, operate a browser,
28 etc., than using a keyboard. Especially in graphical environments a computer
29 mouse is more or less essential to enable users to provide simple "point and click"
30 instructions to the computer. The main advantage of a mouse over a keyboard is
31 simplicity. There are also some operations that are much easier to perform with a
32 mouse than a keyboard, such as picking an item on a screen or choosing from a

1 list of options. Often a document or a web page holds more information than can
2 fit on one screen. Thus, scrolling is an easy way to navigate on the web page.

3 It is easy to scroll up and down and side to side by using also the
4 horizontal or vertical on-screen scroll bars at the bottom and on the right hand side
5 of the screen. To scroll using the on-screen scroll bars, the user has simply to
6 position his pointer on a slider on the scroll bar, to hold a mouse button down and
7 to track the slider up and/or down on the vertical scroll bar or side to side on the
8 horizontal scroll bar. It is also possible to position the pointer over arrows at the
9 top and the bottom of the vertical scroll bar (left and right sides of the horizontal
10 scroll bar) to move one line at a time.

11 A much faster and more convenient way of scrolling a page that holds
12 more information than can fit on one screen is by using a wheel mouse. This kind
13 of computer-mouse holds a wheel which is located between the two buttons. This
14 wheel is programmed to move the image on the screen and it is possible to
15 customise its movements. The most common use of the wheel mouse is for
16 scrolling up and down a web page or a text document. Recent wheel mice include
17 wheels which are coupled to a switch, so that the user can conveniently use the
18 wheel for scrolling and "clicking", e.g. selecting or executing an item or a program.

19 The user can choose between three interfaces for connecting the mouse
20 to the computer, depending on the computer system and other equipment in use.
21 The user can plug the mouse into a serial port, e.g. COM1, COM2, etc. Another
22 possibility is to choose a PS/2 mouse port, which is essentially a serial port but at
23 a different I/O address and with a different IRQ. As USB ports become more and
24 more common, a USB mouse can be connected to a USB port.

25 Since programs and applications are getting more and more complex, as
26 mentioned above, more and more time is needed to find and select an item which
27 is in a menu or a sub-menu. In order to select an item which is associated with the
28 sub-menu, the user has to point with the pointer to a menu which is associated
29 with the sub-item, then he has to move the pointer inside the menu to an item of
30 the menu which is associated with the sub-menu. When this is done, the sub-
31 menu opens. Subsequently, the user has to point the pointer inside the sub-menu
32 and then to select the desired sub-item. The user has to complete even more

1 steps, if he wants to select an item which is embedded in a further sub-menu. It is
2 thus clear that the user is forced to move the computer mouse a great deal, which
3 is associated with a loss of time.

5 SUMMARY OF THE INVENTION

6
7 A first aspect of the present invention is directed to a graphical user
8 computer interface enabling a user to open at least one menu and to select an
9 item of the menu by means of a pointing device. That pointing device comprises a
10 two-dimension actuator and a one-dimension actuator and controls a moveable
11 pointer and a moveable menu item focus. The two-dimension actuator controls
12 movements of the pointer, and the one-dimension actuator is activated when the
13 menu is opened to control movement of the menu item focus within the menu.

14 According to another aspect, the invention provides a graphical user
15 computer interface enabling a user to open at least one menu and to select an
16 item of the menu by means of a pointing device. Said pointing device controlling a
17 moveable pointer and a moveable menu item focus, wherein, after the menu has
18 been opened, the pointer stays at the position it was in when the menu was
19 opened, while the menu item focus is moveable within the menu by means of the
20 pointing device without moving the pointer.

21 According to a further aspect, the invention provides a computer
22 comprising a display and a pointing device with a two-dimension actuator and a
23 one-dimension actuator. Said computer is programmed such that it provides a
24 graphical user interface enabling a user to open at least one menu in the display
25 and to select an item of the menu by means of the pointing device. Said pointing
26 device controls a moveable pointer and a moveable menu item focus such that
27 the two-dimension actuator controls movements of the pointer, and the one-
28 dimension actuator is activated when the menu is opened to control movement of
29 the menu item focus within the menu.

30 According to still another aspect, the invention provides a computer
31 comprising a display and a pointing device. Said computer is programmed such
32 that it provides a graphical user interface enabling a user to open at least one

1 menu in the display and to select an item of the menu by means of the pointing
2 device. Said pointing device controls a moveable pointer and a moveable menu
3 item focus such that, after the menu has been opened, the pointer stays at the
4 position it was in when the menu was opened, while the menu item focus is
5 moveable within the menu by means of the pointing device without moving the
6 pointer.

7 According to still another aspect, the invention provides a computer
8 program add-on including program code, when combined with program code
9 representing a graphical user interface, for enabling a user to open at least one
10 menu and to select an item of the menu by means of a pointing device. Said
11 pointing device comprising a two-dimension actuator and a one-dimension
12 actuator and controlling a moveable pointer and a moveable menu item focus,
13 wherein the two-dimension actuator controls movements of the pointer.
14 Additionally, the one-dimension actuator is activated when the menu is opened to
15 control movement of the menu item focus within the menu.

16 Finally, the invention is directed to a computer program add-on including
17 program code, when combined with program code representing a graphical user
18 interface, for enabling a user to open at least one menu and to select an item of
19 the menu by means of a pointing device, said pointing device controlling a
20 moveable pointer and a moveable menu item focus. After the menu has been
21 opened, the pointer stays at the position it was in when the menu was opened,
22 while the menu item focus is moveable within the menu by means of the pointing
23 device without moving the pointer.

24 Other features are inherent in the graphical user computer interfaces, the
25 computers and the computer program add-on's disclosed or will become apparent
26 to those skilled in the art from the following detailed description of embodiments
27 and its accompanying drawings.

28 29 DESCRIPTION OF THE DRAWINGS

30
31 In the accompanying drawings:

Fig. 1 illustrates a graphical user computer interface by showing a detail, a menu;

Figs. 2a-2c illustrate another detail of a graphical user computer interface, a context menu;

Figs. 3a-3c illustrate another embodiment of a context menu;

Fig. 4 is a state diagram relating to the graphical user interface;

Fig. 5 illustrates a computer system;

Figs 6a and 6b show a wheel mouse and a simple computer mouse;

Fig. 7 illustrates components of a simple computer mouse.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Fig. 1 illustrates a preferred embodiment of a graphical user computer interface by showing a detail, a menu. This preferred embodiment of the graphical user computer interface enables a user to open at least one menu displayed on a computer screen and to select an item of the menu by means of a pointing device which moves a pointer on a screen of a computer system.

Before proceeding further with the description, however, a few items of the preferred embodiments will be discussed.

In the preferred embodiments the interface is a man-machine interface for proceeding a man-machine communication. This kind of interface differs from the kind of man-machine interface which serves to translate inputs from a user into a machine readable code, e.g. a keyboard. In a keyboard every input, i.e. push-button is static/determined and a user can input a fixed set of commands, determined by the keyboard. For example, using the "F1" button opens help-functions, using the "end" button moves the cursor to the end position of a row and, as a matter of course, using the letter buttons provides the computer system with text or information.

The graphical user computer interface of the preferred embodiments is not a static interface as described above, but rather a dynamic one, the commands of which are not limited to a fixed set, as described above. This kind of interface rather offers the possibility to provide the computer system with "program individual inputs". The inputs are provided by the user selecting graphical

elements, instead of static buttons, as in the case of the keyboard. The interface of the preferred embodiments is not to be understood as a "device", but rather as a functionality provided by a computer program, when running on a computer or, alternatively, a computer which is programmed such that it provides the interface functionality. The visible part of the user interface is displayed on the computer screen. The preferred embodiments include on the one hand embodiments in which the pointing device only has a two-dimension actuator (e.g. a ball with rotation sensors for two different axes), and, on the other hand, embodiments with a two-dimension actuator and a one-dimension actuator (e.g. a wheel). In all embodiments, the pointing device may also have switching devices (e.g. buttons, wheel switches).

In the preferred embodiments the menu is a graphical output, in particular a frame which includes graphical elements representing the menu items. After the menu has been opened (for example by positioning the pointer on a menu opening element and, optionally, clicking it), the menu is displayed and a menu item can be selected (for example by moving the focus onto the desired menu item), where upon the menu item is activated, e.g. a process associated with the menu item is started. In some of the preferred embodiments, after the menu has been opened, the pointer stays at the position it was in when the menu was opened. In this situation, the menu item focus is moveable within the menu by means of the pointing device without moving the pointer. In some of these embodiments the menu item focus can be moved by moving the one-dimension actuator or, in alternative embodiments, by moving the two-dimension actuator. In embodiments in which the pointing device is provided with a one-dimension actuator, it is preferred to use that actuator for moving the menu item focus, instead of using the two-dimension actuator.

In the preferred embodiments, the menu item focus is a graphical output which accentuates at least one item of the menu. The accentuation can be performed by framing one item of the menu and/or pointing out said item by a highlight. Of course, other forms of accentuation are possible.

In the preferred embodiments the menu is opened by positioning the pointer on a displayed element, associated with the menu. In some embodiments

1 the opening is performed by clicking on the element, in other embodiments without
2 clicking. The second alternative (without clicking on the element) can be provided
3 with a time delay function which retards the opening of the menu for a period,
4 such as one to three seconds.

5 In the preferred embodiments, a menu item is activated by positioning the
6 focus on it, with or without clicking on the menu item. In some embodiments the
7 activating is performed by clicking the menu item (e.g. by pressing a mouse button
8 or, if a wheel mouse is used, by actuating a switch integrated in the wheel
9 mechanism), in other embodiments without clicking. In the second alternative
10 embodiment (without clicking the menu item), the actual activation of the menu
11 item can be retarded for a period, e.g. one to three seconds. In both alternatives,
12 opening of the menu or activating of the menu item can be performed in other
13 ways, such as by pushing a button on the keyboard, etc.

14 In the preferred embodiments an operational shift from a pointer modus to
15 a menu item focus modus is activated automatically upon opening of the menu.
16 This operational shift causes the pointer to stay at the position it is in and causes
17 the one-dimension actuator (in the embodiment with the one-dimension actuator)
18 and the two-dimension actuator (in the embodiment with the two-dimension
19 actuator) to control the one-dimensional movement of the menu item focus.
20 However, in embodiments with a one-dimension actuator it is likewise possible
21 that the pointer is not arrested, but remains movable under the control of the two-
22 dimension actuator in the menu item focus modus. This menu item focus modus
23 is held up as long until a shift back to the pointer modus occurs.

24 Normally, if a menu item has been activated and the associated process
25 started, the opened menu will disappear and the menu item focus modus will
26 automatically switch back to the pointer modus. However, the disclosed
27 embodiments also enable the user to close the opened menu without activating a
28 menu item focus. In one embodiment, the menu is closed by a relative movement
29 of the menu item focus out of the menu. In other embodiments the menu is closed
30 by selecting a special menu-closing item. This menu-closing item can be
31 displayed within the menu, as the menu items, and can be selected by one-
32 dimensional movement of the focus and activated, as the menu items. However,

1 in embodiments with a one-dimensional actuator and a pointer movable in the
2 menu item focus modus it is likewise possible to provide the menu-closing item at
3 a position which is only reachable by the pointer (e.g. in a corner of the menu).
4 Then, the menu is closed by moving the pointer under the control of the two-
5 dimension actuator to the menu-closing item and, optionally, by clicking on it. The
6 menu item focus modus shifts back to the pointer modus upon closing the menu.
7 This shift enables the pointer to be moved again (if it was arrested).

8 There are different ways in which the movement of the menu item focus
9 within the menu is performed. In some embodiments, the menu item focus is
10 moveable while the menu is fixed on the screen. In other embodiments however
11 the menu item focus is fixed on the screen while the menu is moveable.
12 Furthermore, hybrids of the two forms are useful in the case of menus too large to
13 be displayed at once, in which the focus is movable but the menu is scrolled when
14 the focus is moved to the edge of the visible part of the menu. In all the above-
15 mentioned cases, there is a relative movement between the menu item and the
16 menu. All these kinds of relative movement can be realized in embodiments
17 having only a two-dimension actuator as well as in embodiments having a two-
18 dimension and a one-dimension actuator.

19 Returning now to Figs. 1 and 5, it illustrates a graphical user computer
20 interface 10 by showing a detail, a menu 12. This visible part of the graphical user
21 computer interface is displayed on a computer screen 22 and comprises in this
22 embodiment a menu bar 11 which includes six menus 12 A to F, each menu
23 "conceals" items 14 of the menu, respectively. The menu can be opened (and in
24 this way the items of the menu are animated) by selecting the menu opening
25 element which is associated with the menu. In the preferred embodiment shown in
26 Fig. 1 the menu A was opened by positioning the pointer 16 on the displayed
27 element A, which is associated to the menu 12, with or without clicking on the
28 element with the pointer 16, by means of a pointing device 30. In the same way,
29 the other menus B to F can be opened, and thus the items of the corresponding
30 menus can be animated. In this preferred embodiment shown in Fig. 1, the menu
31 12 of the menu element A holds four items of the menu 14 (A1 to A4) which were
32 animated after the user selected the menu element A with the pointer 16. After the

1 menu 12 has been opened, the pointer 16 stays at the position it was in when the
2 menu 12 was opened. Upon the opening of the menu 12, an operational shift from
3 a pointer modus to a menu item focus modus is activated automatically. By
4 opening the menu, a menu item focus 18 accentuates one item of the menu 14. In
5 a preferred embodiment, the first upper item of the menu 14 will be accentuated
6 by the menu item focus 18 (seen here as highlighted text for item "A2") upon
7 opening the menu 12. However, the menu item focus 18 can be at other positions
8 inside the menu 12 upon opening the menu. The user now has the possibility to
9 move the menu item focus 18 to other positions. In the embodiment shown in Fig.
10 1 the user moved the menu item focus for example from position A1 to position
11 A2. In an embodiment with a one-dimension actuator it is likewise possible that
12 the pointer is not arrested, but remains movable under the control of the two-
13 dimension actuator in the menu item focus modus. If the one-dimension actuator
14 is a wheel, the user rotates the wheel, for example with his index finger, just one
15 position downward, to move the menu item focus from position A1 to position A2.
16 In another embodiment, which is preferred when the pointing device 30 is not
17 provided with the one-dimension actuator, the menu item focus 18 is moveable
18 within the menu 12 by means of the pointing device 30. In this case the user
19 moves the menu item focus just by moving the simple computer mouse 34 in a
20 downward direction, until the menu item focus is at position A2. In this
21 embodiment, the pointer 16 stays at the position it was in when the menu was
22 opened, as shown in Fig. 1. In another embodiment, the pointer 16 can be in
23 another position, maybe at the centre of the screen or at other predefined
24 positions.

25 In this embodiment of a graphical user computer interface 10, shown in
26 Fig. 1, the user can move the menu item focus 18 to any other position inside the
27 menu, as indicated by the double arrow. Now the user has the possibility to
28 activate a desired menu item 14 by positioning the focus on it and clicking on the
29 menu item. In another embodiment, the menu item can be activated by positioning
30 the focus on it without clicking on the menu item. In this embodiment, after
31 positioning the focus on a desired menu item, said menu item is activated after a
32 delay of time, for example one to three seconds.

1 Normally, if a menu item has been activated and the associated process
2 started, the opened menu will disappear and the menu item focus modus will
3 automatically switch back to the pointer modus. Besides this there is another
4 possibility which enables the user to close the opened menu without activating a
5 menu item focus. In this case the user can close the menu by a relative movement
6 of the menu item focus out of the menu. In a preferred embodiment in which the
7 pointing device is provided with the one-dimension actuator 32, the user can move
8 the menu item focus 14 out of the menu 12 by operating said one-dimension
9 actuator, or by selecting a menu closing item 19 (shown in Fig. 2), by using the
10 one-dimension actuator or the two-dimension actuator. In another embodiment, in
11 which the pointing device does not include the one-dimension actuator 32, this
12 operation can only be executed by operating the two-dimension actuator. After
13 closing the menu A, the operation modus shifts back from the menu item focus
14 modus to the pointer modus and thus the user can move the pointer 16 as usual.
15 Now the user can, for example, select another menu element, e.g. menu element
16 B.

17 Figs. 2a to 2c illustrate another detail of a graphical user computer
18 interface 10, a context menu 12 which could have been opened for example by
19 clicking a button of the pointing device 30. The context menu 12 could also be
20 opened by other means, e.g. by means of the keyboard 26.

21 Most Windows programs, developed by Microsoft (Microsoft is a
22 trademark of Microsoft Corporation) provide the possibility to open a context menu
23 12 which offers a "short-cut" selection of the most important features. For
24 example, the word processing program WORD, developed by Microsoft offers the
25 possibility to open a context menu 12 also includes the items "cut-off, copy, paste,
26 etc.", the context menu 12 also includes items for changing the letters, the
27 paragraph between two adjacent rows and for inserting a numeration. The context
28 menu 12 thus offers the possibility to make modifications in a short time.

29 As can be seen from the Figs. 2a-c, the pointer 16 stays at the position it
30 was in when the (context) menu 12 was opened, while the menu item focus 18
31 (here denoted by the darker menu item) is moveable within the menu 12 by
32 means of the pointing device 30 without moving the pointer 16.

1 In a preferred embodiment shown in Fig. 2a, upon opening the menu 12,
2 the menu item focus 18 stays at the first upper position of the menu 12. Now, the
3 menu 12 can be moved while the menu item focus 18 is fixed, which can be seen
4 in Figs. 2b-2c. Thereby, the relative position of the menu item focus 18 is changed
5 inside the menu 12 and a desired item of the menu 14 can be selected by moving
6 the menu 12 in an upward direction, as shown in Fig. 2b. Fig. 2c shows that it is of
7 course possible to move the menu 12 in a downward direction again. This one-
8 dimensional movement can be affected by operating the one-dimension actuator
9 32. Hence, the movement can also be achieved by moving the pointing device 30,
10 i.e. the two-dimension actuator. In this case, after the context menu 12 has been
11 opened, the pointer 16 stays at the position it was in when the menu 12 was
12 opened, while the menu item focus 18 is moveable within the menu 12 by means
13 of the pointing device 30 without moving the pointer 16.

14 After selecting the desired menu item 14 as described above, the menu
15 item 14 is activated by positioning the focus on it, with or without clicking on the
16 menu item 14. In a preferred embodiment the user can close the context menu by
17 a relative movement of the menu item focus out of the menu. In another
18 embodiment the user can close the context menu by selecting the menu closing
19 item 19, in comparison to the description of the embodiment shown in Fig. 1.

20 Figs. 3a to 3c illustrate another embodiment of a context menu, wherein
21 the menu item focus 18 is moveable while the menu 12 is fixed, upon operation of
22 the one-dimension actuator 32 or by operating the pointing device 30. After the
23 context menu 12 has been opened, the pointer 16 stays at the position it was in
24 when the menu 12 was opened while the menu item focus 18 is moveable within
25 the menu 12 by means of the pointing device 30 without moving the pointer 16. In
26 Fig. 3b it is shown that the menu item focus 18 is moveable in a downward
27 direction by operating the one-dimension actuator 32, as well as being movable in
28 an upward direction. However, in another embodiment it is also possible to move
29 the menu item focus 18 by moving the pointing device 30, i.e. the two-dimension
30 actuator.

31 In the cases shown above the menu item is activated by positioning the
32 focus on it, and clicking on the menu item. It is also possible that the menu item is

1 activated by positioning the focus on it without clicking on the menu item. In this
2 case, it is reasonable that a time delay of e.g. two or three seconds, is
3 implemented, after which the menu item is activated.

4 In a preferred embodiment an operational shift from a pointer modus to a
5 menu item focus modus is activated automatically upon opening of the menu 12.

6 In another embodiment the menu 12 is closed by a relative movement of
7 the menu item focus 18 out of the menu 12, by operating the one-dimension
8 actuator 32, or by selecting the menu closing item 19 with the one-dimension
9 actuator 32 or the two-dimension actuator. In the case that the pointing device 30
10 is not provided with the one-dimension actuator 32 it is unnecessary to mention
11 that the operation mentioned above can only be executed by the two-dimension
12 actuator. The context menus 12 shown in Figs. 3, as well as the context menus
13 shown in Figs. 2, are provided with a menu closing item 19 at the lowest position.
14 The menu closing item 19 can also be placed at other positions within the menu
15 12. This menu closing item can be displayed within the menu, as can the menu
16 items, and can be selected by one-dimensional movement of the focus and
17 activated in the same way as the menu items.

18 Fig. 4 is a state diagram for illustrating the operational shift from a pointer
19 modus to a menu item focus modus and back. Generally, in state U1 the
20 operation modus is in the pointer modus. In this state the pointer 16 can be used
21 as known and follows the movement in accordance with the movement of the
22 pointing device 30. In step U2, by opening a menu 12, the operational modus
23 shifts into state U3 to the menu item focus modus. In this state the pointer 16
24 stays at the position it was in when the menu 12 was opened. The pointer 16 can
25 also stay at other positions displayed on the screen 22. In this state the menu item
26 focus 18 is moveable within the menu 12 by means of the pointing device 30
27 without moving the pointer 16. In a preferred embodiment the user can select an
28 item of the menu 14 inside the menu 12 by means of the one-dimension actuator
29 or the two-dimension actuator where the pointing device 30 is provided with a one-
30 dimension actuator 32. In another embodiment the user can select the item of the
31 menu solely by moving the two-dimension actuator, when the pointing device 30 is
32 not provided with a one-dimension actuator 32 such as in the case of the simple

1 computer mouse 34. When the menu is closed by an explicit operation of the user
2 in step U4, the operational modus shifts back to a pointer modus and reverts to
3 the state U1. In step U4 the user can close the menu in a preferred embodiment if
4 a menu item has been activated and the associated process started. Also by a
5 relative movement of the menu item focus 18 out of the menu 12 by operating the
6 one-dimension actuator 32 or by selecting a menu closing item 19 with the one-
7 dimension actuator or the two-dimension actuator, the menu can be closed. In
8 step 4, the user can also close the menu by activating a menu item 14. In this
9 case the user can activate the menu item by positioning the menu item focus 10
10 on it, with or without clicking on the menu item. When returned to state U1 (to the
11 operational modus) the user can move the pointer 16 by moving the pointing
12 device 30, as usual.

13 Fig. 5 illustrates a computer system 20. The computer system comprises
14 a screen 22, a processing unit 24, a keyboard 26 and a pointing device 30. The
15 detail of the graphical user computer interface 10 in a preferred embodiment
16 shown in Fig. 1, as well as the other details of graphical user interfaces of other
17 embodiments illustrated in Figs. 2 and 3, are displayed on the computer screen
18 42. The functionality of the graphical user computer interfaces 10 mentioned
19 above is provided by a computer program, when running on the processing unit
20 24. Alternatively, the processing unit 24 is programmed such that it provides the
21 interface functionality.

22 Figs. 6a to 6b show preferred embodiments of a pointing device 30. Fig.
23 6a shows an embodiment of a pointing device 30 with a one-dimension actuator
24 32, which is a wheel. This kind of pointing device is a so-called wheel mouse 36.
25 The wheel combination simplifies the scrolling and searching of documents, which
26 reduces the number of times a user has to move his hand from mouse to
27 keyboard. Other embodiments of a one-dimension actuator 32 are possible.

28 Fig. 6b shows a simple computer mouse 34, which is the most common
29 pointing device 30 used for computer systems 20, and almost as essential as a
30 keyboard. Competitive devices such a track balls and touch sensitive pads (not
31 shown) have flourished, but they are nowhere near as prevalent as the simple
32 computer mouse.

Fig. 7 illustrates components of a simple computer mouse 34. As shown in the figure the computer mouse contains two kinds of input electronics, one part of the computer mouse detects movement and reports it, the other part detects button activity and reports that. The movements of the computer mouse are converted into electrical signals and then transmitted to the computer system 20. The computer mouse shown in this figure uses a mechanical ball 40 for sensing the movement. This ball 40, when it rolls, causes two rollers 42, 42' to turn. The rollers are mounted perpendicular to each other so that they each detect one of two directions. The movements of the rollers 42, 42' are coupled into motion-digitizers 44, 44' that sense rotation. These motion-digitizers 44, 44' thus report that rotation to a processor interface 46, which creates and sends messages to the computer system. Also signals from buttons 48, 48', 48'', provided on the top of the computer mouse 34, are transmitted to said processor interface 46.

All functionalities described above can be implemented in an operating system as well as in an application system environment, although it is more reasonable to implement the functionalities in the library of the operating system.

However the functionalities can be developed and distributed "from outside", i.e. as additional parts to Windows (95/98/ME/NT4/2000/XP), or as a window-manager for UNIX, from third parties. Another possibility is offered by JAVA as an independent operating system for implementing said functionalities. In this case, the framework, e.g. Swing-Classes, which is used for displaying the windows, must be adapted.

With the preferred embodiments, the user is not forced to move the mouse as far as with prior solutions. After the item of the menu 14 has been chosen the pointer is located in the same position as it was in before the menu was opened. This can be advantageous if context-sensitive menus are opened, for example. This is because after the item of the menu has been selected, the mouse pointer 16 still stays over the element for which the context menu was opened, providing the ability to proceed immediately with further commands. When using the computer mouse, the hand of the user is less moving because only the fingers have to be moved, not the whole hand, as when moving a conventional mouse. Thus, a general purpose of the preferred embodiments is to

1 provide an improved graphical user computer interface which is easy to handle
2 and reduces a user's loss of time.

3 All publications and existing systems mentioned in this specification are
4 herein incorporated by reference.

5 Although certain methods and products constructed in accordance with
6 the teachings of the invention have been described herein, the scope of coverage
7 of this patent is not limited thereto. On the contrary, this patent covers all
8 embodiments of the teachings of the invention fairly falling within the scope of the
9 appending claims either literally or under the doctrine of equivalence.

10

What is claimed is:

1. A graphical user computer interface enabling a user to open at least one menu and to select an item of the menu by means of a pointing device, said pointing device comprises a two-dimension actuator and a one-dimension actuator and controls a moveable pointer and a moveable menu item focus,

wherein the two-dimension actuator controls movements of the pointer, and the one-dimension actuator is activated when the menu is opened to control movement of the menu item focus within the menu.

2. The graphical user computer interface of claim 1, wherein, after the menu has been opened, the pointer stays at the position it was in when the menu was opened, while the menu item focus is moveable within the menu by means of the pointing device without moving the pointer.

3. The graphical user computer interface of claim 1, wherein the menu is opened by positioning the pointer on a displayed element, associated with the menu, with or without clicking on the element.

4. The graphical user computer interface of claim 1, wherein the menu item is activated by positioning the focus on it, with or without clicking on the menu item.

5. The graphical user computer interface of claim 1, wherein an operational shift from a pointer modus to a menu item focus modus is activated automatically upon opening of the menu.

6. The graphical user computer interface of claim 1, wherein the menu item focus is movable while the menu is fixed or the menu item focus is fixed while the menu is movable, upon operation of the one-dimension actuator.

1 7. The graphical user computer interface of claim 1, wherein the menu is
2 closed by a relative movement of the menu item focus out of the menu, by
3 operating the one-dimension actuator, or by selecting a menu closing item with the
4 one-dimension actuator or the two-dimension actuator.

5
6 8. The graphical user computer interface of claim 1, wherein an operation
7 modus shifts from a menu item focus modus back to a pointer modus upon
8 closing of the menu.

9
10 9. The graphical user computer interface of claim 1, wherein the one-
11 dimension actuator is a wheel.

12
13 10. A graphical user computer interface enabling a user to open at least
14 one menu and to select an item of the menu by means of a pointing device, said
15 pointing device controlling a moveable pointer and a moveable menu item focus,
16 wherein, after the menu has been opened, the pointer stays at the position it
17 was in when the menu was opened, while the menu item focus is moveable within
18 the menu by means of the pointing device without moving the pointer.

19
20 11. The graphical user computer interface of claim 10, wherein the menu is
21 opened by positioning the pointer on a displayed element, associated with the
22 menu, with or without clicking on the element.

23
24 12. The graphical user computer interface of claim 10, wherein the menu
25 item is activated by positioning the focus on it, with or without clicking on the menu
26 item.

27
28 13. The graphical user computer interface of claim 10, wherein an
29 operational shift from a pointer modus to a menu item focus modus is activated
30 automatically upon opening of the menu.

31
32 14. The graphical user computer interface of claim 10, wherein the menu

1 item focus is movable while the menu is fixed or the menu item focus is fixed while
2 the menu is movable, by operating the pointing device.

3

4 15. The graphical user computer interface of claim 10, wherein the menu is
5 closed by a relative movement of the menu item focus out of the menu, by
6 operating the two-dimension actuator, or by selecting a menu closing item with the
7 two-dimension actuator.

8

9 16. The graphical user computer interface of claim 10, wherein the pointing
10 device is a computer-mouse.

11

12 17. A computer comprising a display and a pointing device with a two-
13 dimension actuator and a one-dimension actuator,

14 said computer is programmed such that it provides a graphical user interface
15 enabling a user to open at least one menu in the display and to select an item of
16 the menu by means of the pointing device,

17 wherein the pointing device controls a moveable pointer and a moveable
18 menu item focus such that

19 the two-dimension actuator controls movements of the pointer, and

20 the one-dimension actuator is activated when the menu is opened to control
21 movement of the menu item focus within the menu.

22

23 18. A computer comprising a display and a pointing device,

24 said computer is programmed such that it provides a graphical user interface
25 enabling a user to open at least one menu in the display and to select an item of
26 the menu by means of the pointing device,

27 wherein the pointing device controls a moveable pointer and a moveable
28 menu item focus such that,

29 after the menu has been opened, the pointer stays at the position it was in
30 when the menu was opened, while the menu item focus is moveable within the
31 menu by means of the pointing device without moving the pointer.

32

1 19. A computer program add-on including program code, when combined
2 with program code representing a graphical user interface, for enabling a user to
3 open at least one menu and to select an item of the menu by means of a pointing
4 device, said pointing device comprising a two-dimension actuator and a one-
5 dimension actuator and controlling a moveable pointer and a moveable menu item
6 focus,

7 wherein the two-dimension actuator controls movements of the pointer, and
8 the one-dimension actuator is activated when the menu is opened to control
9 movement of the menu item focus within the menu.

10
11 20. A computer program add-on including program code, when combined
12 with program code representing a graphical user interface, for enabling a user to
13 open at least one menu and to select an item of the menu by means of a pointing
14 device, said pointing device controlling a moveable pointer and a moveable menu
15 item focus,

16 wherein, after the menu has been opened, the pointer stays at the position it
17 was in when the menu was opened, while the menu item focus is moveable within
18 the menu by means of the pointing device without moving the pointer.

19

ABSTRACT

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The invention is directed to a graphical user computer interface which enables a user to open at least one menu and to select an item of the menu by means of a pointing device, said pointing device comprises a two-dimension actuator and a one-dimension actuator and controls a moveable pointer and a moveable menu item focus, wherein the two-dimension actuator controls movements of the pointer, and the one-dimension actuator is activated when the menu is opened to control movement of the menu item focus within the menu. The invention is also directed to a contributing computer and a computer program add-on.

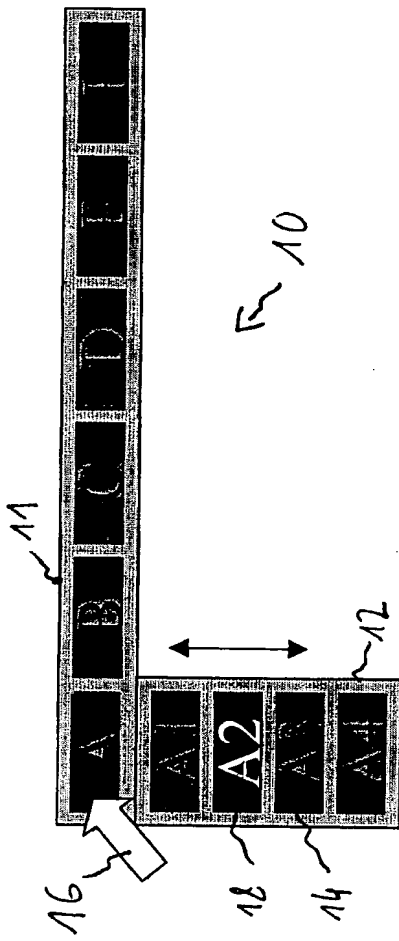


Fig. 1

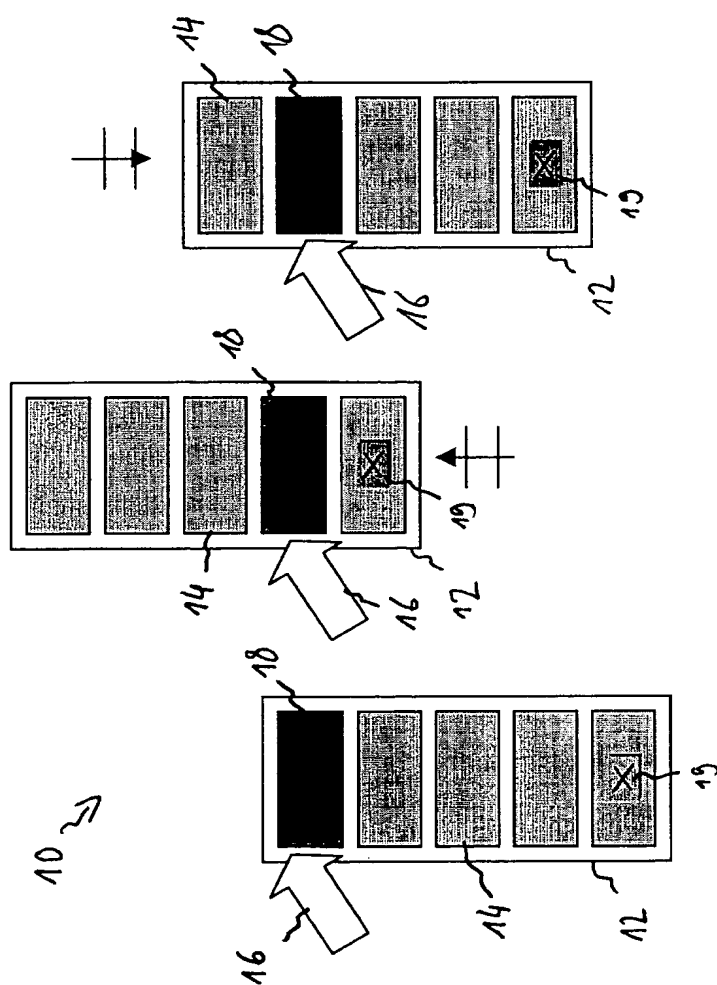


Fig. 2c

Fig. 2b

Fig. 2a

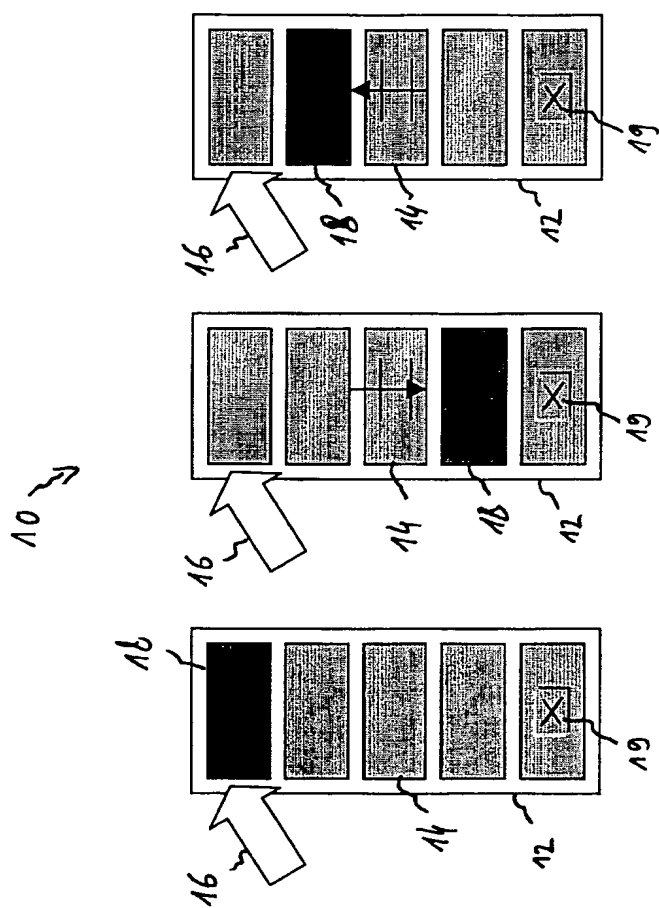


Fig. 3c

Fig. 3b

Fig. 3a

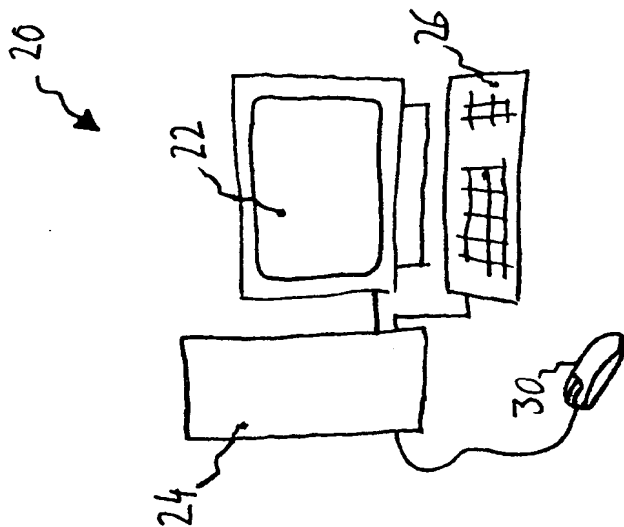


Fig. 5

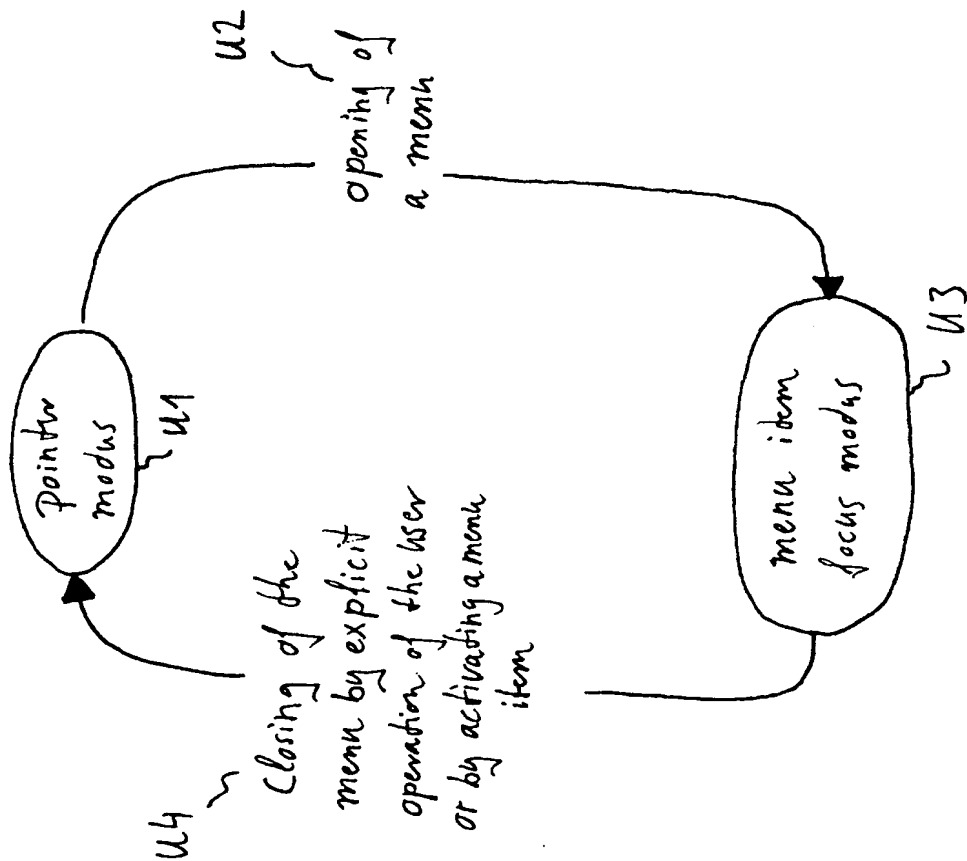


Fig. 4

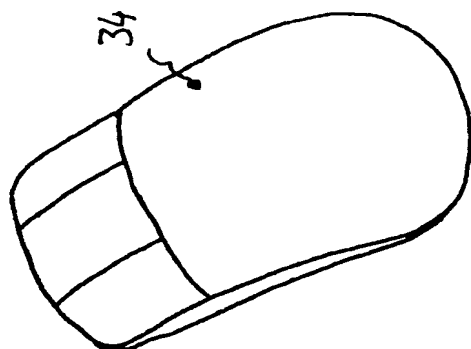


Fig. 6b

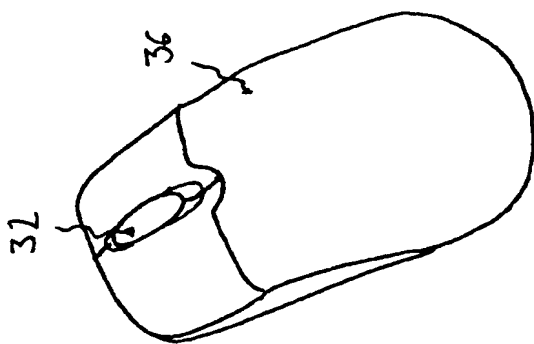


Fig. 6a

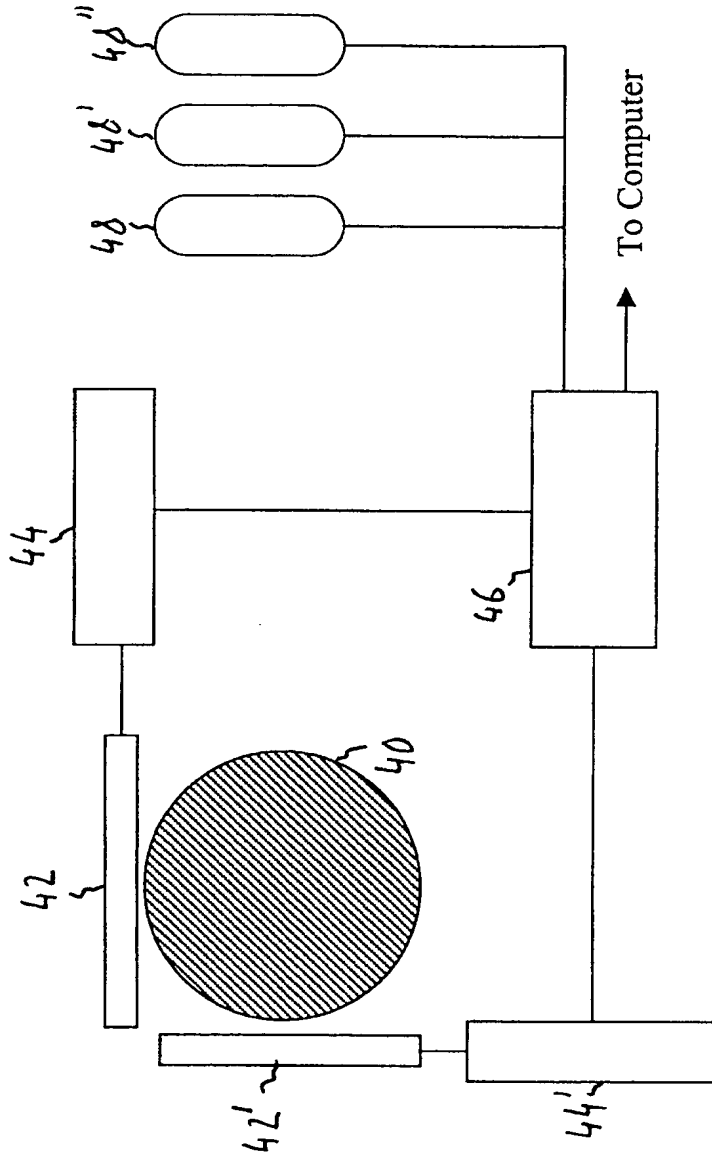


Fig. 7

